

# ASR from a Legal Perspective

Denise D. Fort – University of New Mexico School of Law

**D**rought, population growth, groundwater mining, and a host of other challenges are accelerating the search for new approaches to water supplies. One promising approach already utilized throughout the United States is using groundwater aquifers for storage and retrieval of waters. I served as a participant on the National Research Council's panel on managed underground storage (here termed aquifer storage and recovery, or ASR) and found the topic to be a rich one for consideration by institutional researchers, because the practice raises an array of legal questions.

The regulatory structure for ASR is complicated because the legal arrangement for managing water historically has separated water quality and water quantity, as well as groundwater and surface water. Several water quality schemes may apply to ASR projects. In certain circumstances authority is divided between the federal and state governments, and states vary in how stringently they regulate these projects. The water quality questions may pale in comparison to the water quantity issues. Water allocation is primarily a matter of state control, but states vary in how they view the right to store and withdraw water. Ownership and control of aquifer storage raise yet other legal issues.

## Water Quality

The regulatory system for protection of water quality depends on how ASR projects are undertaken. In general, protection of the groundwater aquifer is regulated by states, and therefore standards vary. Protection of wellheads of drinking water systems is a matter of federal law, administered by the states. States may in fact provide a higher degree of protection for aquifers than required by federal law.

The greatest sources of regulatory conflict seem to be over the degree of protection required for aquifers. If a state prohibits any degradation of an aquifer, this puts a costly burden on an ASR project developer. From a pragmatic perspective, the question is whether it is preferable to require a high degree of treatment before injection/infiltration, or after water is withdrawn.

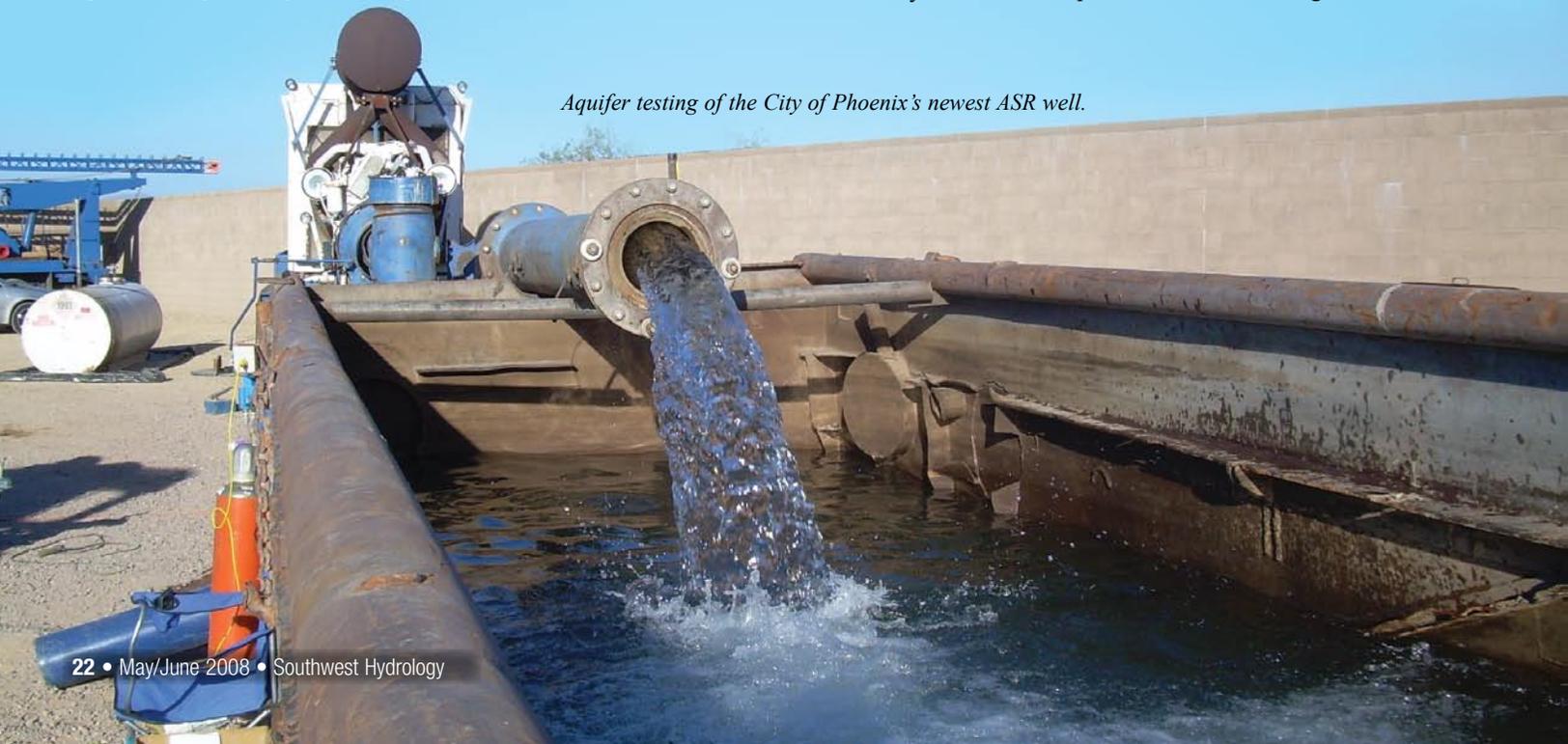
Have most states sufficiently weighed the water resource and pollution risks and benefits of ASR projects against the long-term protection of aquifers? Probably not, since such projects still are relatively novel. In fact, nondegradation of aquifers may be a standard that prevents projects from going forward that offer greater benefits than risks, and causes costlier treatment than is necessary.

Federal involvement in ASR projects is relatively limited. Insofar as projects are conducted through injection wells, federal UIC (Underground Injection Control) regulations apply, either through the U.S. Environmental Protection Agency or state-delegated programs. Recharge through infiltration is not regulated by the EPA, although permits may be required for the discharge to surface water (National Pollutant Discharge Elimination System permit) and for alterations to streambeds (Section 404 of the Clean Water Act). The distinction appears to be an accidental consequence of the federal regulatory structure, and not a statement about which type of project presents greater risks to aquifers. The federal UIC program is a narrow groundwater protection program directed at a particular source of groundwater pollution, the injection of wastes into groundwater.

Another policy question is whether the federal government should be more involved in regulation of these projects, or less. The current federal role seems to be as a backstop for inadequate state regulation, but only for certain types of projects.

In general, one could argue for an expanded federal role in groundwater

*Aquifer testing of the City of Phoenix's newest ASR well.*



protection because so many sources of groundwater pollution are inadequately regulated by either federal or state governments. Pollution from mining, energy production, and agriculture, for example, can be politically difficult for states to regulate when they are competing to attract such industries. States do not compete for ASR projects, however, and I am aware of no evidence that the states are failing to adequately regulate them. Furthermore, groundwater pollution risks posed by ASR projects appear minimal compared to many other projects, thus they would seem to offer a good opportunity to allow states to function as the “laboratories of democracy.”

### **Water Quantity**

State control over the use of water is well-established. Federal issues do arise, as for example, when federal funds are used for an ASR project, or where federally owned water rights are proposed as the source water. However, each state’s water regime varies, and some states do not clearly address the water rights issues raised by projects.

ASR projects must own or have a right to control the water that is used for recharge. Effluent, one possible source water, is not necessarily owned by the entity that wishes to recharge the aquifer. Critical questions about control of the aquifer are whether the project can use aquifer space for storage and whether the recharger has control of the water that it has put into the aquifer. Generally, a state government would expect to be able to use an aquifer for storage without a clear legal basis to do so, but the use of aquifer storage space becomes a thorny legal problem when there are multiple entities pumping groundwater in the aquifer. The legal questions would be most pointed if a commercial entity proposed such an operation in an aquifer. In any event, the right to use the capacity of an aquifer for storage will have to be resolved by statute or under the common law.

Another set of legal concerns arises from how to protect the investment in the water that has been recharged

without harming other entities that may be extracting water from the aquifer. Where multiple entities utilize an aquifer,

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explicit legal guidance or contracts among the groundwater users would be necessary. Finally, there are potential liability concerns should a project cause impairment of another’s water rights.

This list of legal concerns might seem daunting and a testament to the desirability of statutory and regulatory schemes that respond to the particular issues raised by ASR projects. Despite the complicated nature of these projects, the NRC report contains discussions of how institutional challenges have been overcome in different jurisdictions.

### **Future Looks Favorable**

Water projects always are complicated, requiring knowledge of both written and unwritten rules and the capacity to ease the way through innumerable barriers. ASR projects are viewed as extraordinarily complex by some, but the successful implementation of these projects suggests that these barriers can be overcome. There are no comprehensive studies of how many technically worthwhile projects failed due to institutional barriers.

A number of factors favor the future of ASR projects. Organized opposition to them by citizen organizations seems to be lacking, except when treated wastewater is proposed for drinking water reuse. Among the choices for water storage, ASR appears to be one of the most benign, since storage underground does not affect river function and it decreases evaporation losses. ASR may even provide ancillary environmental benefits. Environmental risks exist, but perhaps have been better addressed than many others associated

with water, such as unregulated pesticide runoff, the effects of oil and gas operations, and even leaking septic systems. A well-thought-out regulatory system, providing appropriate information about risk, opportunities for public participation, and appropriate regulation should allow this technology to be utilized.

State governments should consider adopting regulatory regimes that specifically address the issues raised by ASR. Doing so lessens transaction costs and provides a more tailored review of issues that arise with respect to these projects. I suggest that it is appropriate for the federal government to assist by providing research funding and for state governments to cooperate in devising templates for regulation, within the constraints of each state’s unique water code.

Contact Denise Fort at [fortde@law.unm.edu](mailto:fortde@law.unm.edu). Read or purchase “Prospects for Managed Underground Storage of Recoverable Water” (National Academies Press, 2008) at [books.nap.edu/openbook.php?record\\_id=12057&page=R1](http://books.nap.edu/openbook.php?record_id=12057&page=R1).

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